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November 27, 1948

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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VOL. 54 NO. 22

YOU CAN BE SURE..IF IT'S Westinghouse

This super-powerful 1½-ton, 28,000-watt electromagnet, developed by Dr. J. E. Goldman of Westinghouse Research Laboratories, is oil-cooled, wound with 6,000 turns of square copper wire.

Magnet "Picks Pockets" Two Feet Away

Enough strength is packed between the poles of this new electromagnet to support a 4,000-pound automobile. It will pick the pockets of the operator standing two feet away and stop his watch at four feet.

One secret behind this magnet's extra power is the special alloy in the pole tips. It was developed by the Westinghouse research laboratories, and gives more magnetic energy than ordinary iron.

But more important, it opens doors to new studies in magnetism and its practical applications—for example: in designing cyclotrons; in the production of smaller and lighter aircraft instruments; and as a research tool for studying the relationship between the crystal line structure of metals and their magnetic properties.

No matter what immediate results accrue from this new electromagnet, Westinghouse research engineers will continue to look for ways to help industry and science move ahead. G-10022

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MEDICINE

Fat Injected into Veins

Vein feeding with fat is a quick way of restoring lost weight in patients who are ill or recovering from sickness because it gives calories quickly.

➤ A QUICK WAY of getting fat, designed for very thin, sick people who cannot eat much, has been developed by Dr. Frederick J. Stare, professor of nutrition at Harvard School of Public Health.

It is done by injecting fat into the veins. The fat, which may be butter, coconut oil or corn oil, is first broken into very tiny particles in a "souped-up" dairy homogenizer. Unless they are extremely small, the fat particles can cause dangerous and even fatal embolism.

Advantage of using fat instead of sugar for the vein feeding to fatten sick persons is that with fat 15 times as many calories can be given in the same amount of fluid.

The body uses the fat very rapidly, Dr. Stare told members of the American Public Health Association at their meeting in Boston. Within six to seven hours it has reached the fat depots in the body. When fat made with radioactive carbon 14 was injected into the veins of rats, the animals were exhaling the radioactive carbon on their breath within less than the 10 minutes it took to get them into a machine for collecting the breath.

Patients will not be getting fat-by-vein feedings just yet because a satisfactory stabilizer for the emulsified fat has not been found. The one first used was all right for rats and dogs but gave a fever to the first patients who got it. The stabilizer first used, however, may become useful to patients with high blood pressure. Along with the fever, it caused a drop in pressure. When given to cats, this drop was both considerable and prolonged, lasting for five or six hours. Dr. Stare and associates plan as soon as they have time to try combining it with protamine zinc, used for slow action insulin, to see whether they can get a long acting blood pressure lowering agent.

The fat-by-vein feeding method may make possible the giving of fat-soluble chemical remedies and may also lead to new knowledge of cancer. The latter, already under study, would come through injection of cancer-causing chemicals into a rat's vein. Information about the possible cancer-causing ability of chemicals could be gained faster this way than through the tedious one of painting the chemical on the animal's skin.

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ENGINEERING-CHEMISTRY

Damage from Antifreezes

➤ SALT-BASE antifreezes in the radiator of your car can ruin its cooling and ignition systems, National Bureau of Standards scientists have found in new tests.

A complete series of engine tests by Bureau scientists, Donald B. Brooks and Ronald E. Streets, revealed that salt-base anti-freezes are likely to corrode engines, necessitating replacements of radiators, water pumps, and cylinder heads. Products of the corrosion will clog up water passages in the radiator, causing overheating and boiling. No known inhibitor can prevent their corrosive action, the scientists state in a newly-published Bureau circular.

Recommended for automotive antifreeze use are the alcohols and the glycols. Petroleum-base antifreezes should be used only if your car is equipped with certain types of synthetic radiator hose. These antifreezes will attack natural or reclaimed rubber.

The safest antifreezes, simple alcohols and glycols, will not corrode engine parts. Tap water with which they are mixed does have a corrosive effect, however. For this reason most antifreezes contain a corrosion inhibitor which lasts during one season's use.

The alcohol—methyl, ethyl, and isopropyl—are largely alike in possessing low boiling points in comparison to water. They must be replaced from time to time, especially during mild weather.

Ethylene glycol and a newcomer, propylene glycol, boil at higher temperatures than water, and are therefore "permanent" anti-freezes, remaining in the radiator when the water boils off.

Harmful salt-base antifreezes have practically no fire hazard; the glycols are also considered safe in that respect. Simple alcohol and petroleum-base antifreezes may ignite in case of a spark reaching them, but, the scientists add, the problem of automobile fires is a secondary one.

The new Bureau of Standards Circular, Automotive Antifreezes, No. 474, can be obtained for 15 cents from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

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SUPERSONIC PARACHUTE—Expelled from V-2 rockets at altitudes up to 100 miles, the parachute, containing delicate research instruments, reaches supersonic speeds before its vanes spread out and gradually slow the device to about 27 miles per hour. I. B. Bensen, General Electric engineer and test pilot, inventor of the device, is pictured at the left.

AERONAUTICS

Device Lowers Instruments Safely from Rocket

➤ A SPINNING device resembling a giant dart which brings safely to the earth delicate instruments from a speeding rocket was revealed by General Electric. It is called a supersonic parachute, or rotochute, but it bears no resemblance to ordinary parachutes.

It has a bomb-shaped body, to hold the instruments, with a pair of rotator blades, a pointed nose, and a tail piece with fins. It is about four feet long and eight inches wide. The rotator blades, when open, extend about eight feet. It can carry a load of instruments weighing from 20 to 30 pounds.

The rotochute, with instruments enclosed, is carried to the upper atmosphere inside a rocket. At the peak of the rocket's flight, it is expelled. As it falls and the air becomes denser, its blades begin to revolve and are gradually forcd into a horizontal position. This acts as a brake, and the device is slowed from supersonic speed to about 27 miles an hour.

Science News Letter, November 27, 1948

The Pacific coast has now one of the country's largest and fastest cold reduction *steel mills;* it can roll strip at a speed of 4,000 feet per minute.

PHYSICS

Neutretto Unnecessary

➤ THE NEUTRETTO is dead. Born of theory to explain a loss of mass when one kind of atomic particle changed into another, it is no longer needed as the result of new and more precise measurements reported to the National Academy of Sciences meeting in Berkeley, Calif.

Dr. Edwin M. McMillan of the University of California's Radiation Laboratory told how measurements of the masses of mesons created in the giant 184-inch Berkeley cyclotron explain how the positive heavy meson decays into a light one without assuming the existence of the now discarded theoretical neutretto (not to be confused with the neutrino).

The neutrino, although as yet undetected, is still needed and scientists are convinced that it is real. Its neutrality and light weight, causing it to have extraordinary penetration, keep it from being found.

The meson masses determined by the team of Dr. Eugene Gardner and Dr. C. M. G. Lattes, who last March announced creation of artificial mesons in the Berkeley cyclotron, are: Heavy meson, 284 times electron mass, instead of 313; light meson, 215 instead of 212.

The hearts or nuclei of atoms are actually porous rather than opaque as previously believed, it is indicated by other cyclotron bombardment data reported by Dr. McMillan.

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MEDICINE

Operation Streptococci

➤ A VACCINE to protect against rheumatic fever, scarlet fever, septic sore throats and other diseases caused by streptococci is now being sought by Army medical scientists.

Their search is part of the all-out offensive against the streptococci announced by Maj. Gen. Raymond W. Bliss, Surgeon General of the Army, at the meeting of the American Public Health Association in Boston. Headquarters for this Operation Streptococci will be at Fort Francis E. Warren, an Air Force Technical Training Center in Wyoming.

The diseases caused by the streptococci could well be the health threat to the armed forces in the next war that malaria was in the last. It would be if the fighting is to be in parts of the world where the streptococci are as prevalent as malaria germs are in the tropics.

Hope of developing a vaccine against the strep. germs seems to depend on finding a way of stepping up what scientists call the "anti-genicity of M substance." The "M substance" is an acid-soluble protein of the germ which calls up germ-fighting antibodies in the body.

Success of the Army's Operation Streptococci will mean better health for civilians as well as the armed forces. The rheumatic fever and strep-caused sore throats that plagued training camps in the last war are common and dangerous ailments of civilians also. Rheumatic fever, because of its effects on the heart, is one of the most crippling, one of the deadliest and one of the most prevalent diseases threatening the health of the American people today. Gen. Bliss stated that significant findings from the Army studies will be made known promptly to the medical world.

The medical world, he said, must in turn contribute to keeping the Army healthy. Some sort of draft of doctors will have to be introduced if not enough volunteer to meet the Army's present need for 1,550 physicians plus 870 to replace those who will be lost from the service next spring when they complete their 24 months service under the Army Special Training Program. Expansion of the Army will increase further the number of physicians needed to keep our soldiers, Army civilian employees and their dependents healthy.

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MEDICINE-ANTHROPOLOGY

Aleuts Aid Heart Study

Their freedom from heart disease has led scientists to study their diet in the hope that it may show the way to control of this condition.

➤ ALEUTIAN Island natives, familiar to American troops who served on remote outposts on the chain of islands between Alaska and Russia during the war, may show the way to a new dietary control of heart disease.

This possibility appears in the report of the Harvard University Expedition, which made a six-field study of Aleuts during this past summer.

The Aleuts enjoy almost complete freedom from heart disease, Dr. Fred Alexander, expedition doctor and heart specialist on the staff of Massachusetts General Hospital, found in his examination of 132 of the fewer than 1,000 natives now on the islands.

Because the Aleuts have always lived mainly on fish and meat, foods high in protein, the scientists wonder whether this type of diet may be partly responsible for the lack of heart disease.

The Aleuts' consistent fish-and-meat eating, changed only when the Russians brought in flour and sugar in the 18th century, is expected to prove helpful also in studying the effect of diet on teeth. During the 2,000 years before the arrival of the Russians, the Aleuts apparently had little or no tooth trouble, Dr. Coenraad Moorrees, of the Forsyth Dental Infirmary, Boston, reports.

Remains of "Lost" Race

Possible discovery of the existence of a "lost" race of North Americans may have been made, Dr. William S. Laughlin, Peabody Museum anthropologist and field director of the expedition, said. Skulls dating back some 2,000 years were found which indicated that Aleutian Islanders of that time were taller than the modern Aleuts found on the islands by the Russians only 200 years ago. The "lost" race was more like present Eskimos than the Aleuts.

Head meausurements made on the modern Aleuts revealed one of the largest heads ever recorded. One Aleut had a cranial capacity of 2,000 cubic centimeters, compared with the 1,450-cubic-centimeter-capacity of average heads.

An excavation of 23 feet made by archaeologists Charles I. Shade of Harvard University and Alan G. May of Wenatchee, Wash., resulted in the discovery of the 2,000-year-old skulls. Theodore Banks of the University of Michigan also used the excavation to make a study of soil samples which may give a record of the effect of climate on vegetation over many centuries.

Other members of the expedition were: Dr. Gordon Marsh of the University of Nevada, who studied the language of the Aleuts, and Dr. Stanley Garn, research fellow at the Forsyth Dental Infirmary, who made a photographic record.

Under the direction of the Peabody Museum of Harvard University, the expedition was sponsored by the Viking Fund and the Office of Naval Research.

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BIOPHYSICS

Red Blood Cells Write Radioactive Signatures

➤ RED BLOOD cells have written their radioactive signatures on photographic film in Rochester, N. Y. The feat was accomplished by a medical research team at the University of Rochester, headed by Dr. George A. Boyd.

The researchers first incorporated radioactive carbon into one of the building-blocks of protein, the amino acid glycine. They then injected this into the body of a rat.

Later, they took some of the rat's blood from the vein in its tail, and smeared a drop of this on photographic film, so thinly that individual red cells stood out by themselves. Radiations from these affected the sensitive emulsion like light rays, leaving microscopic dots when the film was developed.

Results of the experiment are described in the journal, SCIENCE (Nov. 12).

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GEOLOGY

Mississippi Grew Giants 75,000,000 Years Ago

➤ A PLACE in Mississippi where living things grew to gigantic size 75,000,000 years ago has been discovered.

Scientists who study the past life of this planet are used to dwarf or pygmy animals discovered as fossils, but Dr. Paul H. Dunn, geologist of Mississippi State College, told the Geological Society of America about ancient creatures that are five times or more the usually normal size.

A fossil known as a cephalopod was five feet in diameter whereas the usual fossil of this sort is only several inches. An oyster-like prehistoric creature, called a rudistid, was more than a foot and a half long compared with the normal few inches.

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NOVEL EXPERIMENT—In order to relate the electrical potential of the heart to the body weight in mammals, an electrocardiogram is made on a fur-seal pup in the Aleutians. Experimenters from left to right are: Dr. Fred Alexander, cardiologist from the Massachusetts General Hospital, Dr. William S. Laughlin of Harvard, and Karl Kenyon, biologist, U. S. Fish and Wildlife Service.

CHEMISTRY

Snatch Nitrogen from Air

➤ AMERICAN agriculture will benefit from a new method of thermal fixation of nitrogen from the air for fertilizer use which Dr. Frederick G. Cottrell was working on at the time of his sudden death.

With a group of scientists at the University of Wisconsin, Dr. Cottrell, famed for his method of electrical precipitation, was perfecting a way of snatching nitrogen out of the atmosphere without the use of large electrical power needed in the usual process which enabled the Germans to make explosives for fighting the first World War.

When a heart attack ended the career of this "scientist's scientist" attending the National Academy of Sciences meeting at Berkeley, Calif., where he was long professor of chemistry, Dr. Cottrell was discussing his new researches with his colleagues.

A fortune of millions of dollars was turned over to public use through the Research Corporation which he founded. His electrostatic method of precipitating smoke, chemical fumes and other particles has cleared the air of industrial wastes and reclaimed valuable products. Cottrell precipitation played an important role in production of high test gasoline, carbon black and dozens of other important products for peace and war. His patents were given by him to the foundation many years ago and during the present year $1,200,000 in grants are being given to promote research from earnings of the application of the process. (*See SNL*, June 21, 1947). Several professors in small and large universities are carrying on research under the Cottrell grants from the Research Corporation.

Dr. Cottrell was one of the rare scientists who remained scientifically active during his whole lifetime. Aged 71 when his latest researches were interrupted by death, his work on electrical precipitation was done when he was about 30. He had been director of the U. S. Bureau of Mines, head of the Fixed Nitrogen Research Laboratory, and consultant to many governmental and research organizations.

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ASTRONOMY

Jupiter's Moon Eclipses

➤ BEGINNING this month, eclipses of Callisto, second largest moon of the planet Jupiter, again are visible. During the next three years, with the aid of a small telescope, you will be able to see this satellite and its shadow move across the planet's disk.

When a satellite comes between Jupiter and the sun, its shadow is seen as a black dot making its way across the bright disk of the planet. The moon itself is usually much harder to spot, for frequently it is equally as bright as the planet.

Callisto has a much lower reflecting power, however, than the other three large satellites, also discovered in 1610 by Galileo Galilei, Italian astronomer and physicist. Thus not only its shadow but this moon itself can be spotted.

While the other three large satellites are eclipsed every time they circle around the planet, about half the time Callisto escapes an eclipse. This occurs when the plane of Jupiter's satellites, as seen from the earth, is at the greatest angle and the satellites are thus far apart. The relatively great distance of Callisto from Jupiter—1,167,000 miles—is largely responsible for the fact that at such times the satellite is not between the planet and the earth. Until a few days ago, there had been no transits of the satellite or its shadow, and no eclipses or occultations of it since August, 1945.

On Tuesday, Nov. 23, this satellite, which is 3,350 miles in diameter and thus much larger than our own moon and even bigger than the planet Mercury, was eclipsed just after sunset. This was not visible from the United States, however, but was seen by people in Central Europe and most of Africa, according to calculations made at the Nautical Almanac Office of the U. S. Naval Observatory.

On Feb. 15, the beginning of an eclipse of Callisto will be visible just before sunrise in the eastern part of the North American continent. The sun will have risen, however, before the eclipse ends several hours later so this will not be seen. Complete eclipses of Callisto may be seen with only a small telescope, however, a number of times during the next three years.

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PLANT PATHOLOGY

Streptomycin By-Product Kills Plant-Disease Fungi

➤ THE SAME fungus that produces streptomycin, deadly to many germs that afflict man, also produces another substance even more deadly to some of the fungi that cause plant diseases. The new antibiotic has been given the name actidione by its discoverer, Dr. Alma Whiffen, research worker on the staff of the Upjohn Company in Kalamazoo, Mich.

At the time of her discovery, Dr. Whiffen was actually seeking an antibiotic that could be used to treat fungus-caused diseases in man, of which athlete's foot is perhaps the commonest example. She isolated this new substance from culture fluid in which *Streptomyces griseus*, source of streptomycin, had been growing. Used against these disease-causing fungi in laboratory vessels, it at first looked promising; but later experiments on actual cases proved disappointing.

In the meantime, the new substance was being tested for its effects on plants, under the screening program of the National Research Council. In the greenhouses of Michigan State College at East Lansing, Drs. Irma M. Felber and C. L. Hamner found that too high a concentration (100 parts per million in water) would injure or kill the oat and bean seedlings used as experimental plants.

When much lower concentrations were tried, however, the effect was radically different. In concentrations from ten down to one parts per million, actidione wiped out, in as little as 48 hours, infections of powdery mildew, one of the most destructive and hard-to-fight of plant diseases, on the leaves of beans, tomato plants and rose bushes, without harming the plants themselves.

Further experiments are now in progress, to discover what other plant-disease fungi it will prevent or kill, in what concentrations it is most effective, and what "spreader" chemicals should be added to the spray or aerosol solutions in which it is used.

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PSYCHOLOGY

Thought Waves Show Up On Brain Wave Record

➤ A BRAIN WAVE that seems to be really a thought wave has been discovered by four psychologists at Tufts College in Medford, Mass. The four are John L. Kennedy, Robert M. Gottsdanker, John C. Armington and Florence E. Gray.

The thought waves, called "kappa waves" by the psychologists, show up on the brain wave record when a person is doing mental arithmetic, trying to tell which of two tones is longer, learning nonsense syllables, naming the 48 states from memory and solving problems.

They even show up occasionally when a person is trying not to think, probably corresponding to the thoughts that come when trying to keep the mind a blank. Talking, aloud or to oneself, is not associated with the new thought waves. Nor are they produced by such non-thinking brain activity as merely hearing a sound or making the response of pressing a key at a signal.

The new thought waves are recorded in the same way as other brain waves but the

electrodes for picking up thought waves are placed just back of the outer edge of the slits between the eyelids. This position suggests, the scientists point out in their report in the journal, SCIENCE (Nov. 12), that the source of the thought waves may be the temporal lobes of the brain.

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ORDNANCE

Soviet Tanks Lack Finish But Are Termed Efficient

➤ RUSSIAN TANKS are rough-looking, but first class fighting machines, declares Col. Robert J. Icks, an Ordnance Reserve officer, in the technical journal, ORDNANCE (Nov.-Dec.). They have thick armor and good guns, and can dish it out as well as take it.

Commenting on their apparent lack of finish, a Russian once remarked to Col. Icks, "To us a tank is built to last for only three shots. One you may get off and may miss, the second the enemy gets off and may miss, and third either one of you hits. It had better be you that hits him because he isn't going to miss the next time."

Tank designers of the USSR, Col. Icks points out, are able to take advantage of information contributed by lend-lease and captured enemy materiel, as well as by their espionage service. In addition, they have many captured and conscripted German tank experts working for them.

In the meantime, the Army has announced the unveiling of the new Patton tank, which took place at the Detroit Arsenal on Armistice Day, with the widow of the famous tank commander of World War II doing the christening.

The Patton tank resembles the present medium M26, but has a speed of 30 miles an hour instead of 20 and it carries as principal weapon a 90-millimeter gun. A waterproof electric system will enable it to ford deep streams, and it can be "winterized" to operate at temperatures as low as 65 degrees below zero Fahrenheit.

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MEDICINE

Chloromycetin May Conquer Cholera and Dysentery

➤ DYSENTERY, cholera, and two relatively new diseases, Q fever and rickettsialpox, are the next diseases expected to fall before the healing power of chloromycetin, streptomycin-like remedy dug out of a sample of earth from Venezuela. These prospects were disclosed by Army scientists at the meeting of the American Public Health Association in Boston. The recently crystallized drug has already shown rapidly curative effects in five other plagues, epidemic typhus, scrub typhus, murine typhus, typhoid fever and Rocky Mountain spotted fever.

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MR. N. Y. SCIENTIST'S DREAM HOUSE—The architect's conception of building in which the New York Academy of Sciences hopes to house its numerous activities is shown here. A $1,000,000 drive is underway to purchase and maintain new quarters. Fourth oldest scientific society in America, the Academy was founded in New York City in 1817. It now lists more than 4,000 members.

AERONAUTICS

Foresee Automatic Flying

In 15 years airplanes will be equipped with all-weather flying aids, radar, television and other devices which will permit automatic flight, expert predicts.

➤ COMPLETELY automatic, weatherproof flying will be possible through use of present flying aids, plus radar, television, electronic computing machines and unbuilt devices for the future—and we'll have it in 15 years.

That's what Howard K. Morgan, vice-chairman of the Radio Technical Commission of Aeronautics, foresaw in connection with the demonstrations of the best there is today in aviation traffic control and navigation.

Devices for greater automatic flight safety recommended by the RTCA were shown at the Wier Cook Airport, Indianapolis, Ind., where the Civil Aeronautics Administration all-weather flying aids are installed.

Already the big airlines are expected to be equipped with the new all-weather devices in the near future. Mr. Morgan, who is assistant research director for Bendix Aviation Corporation Radio Division, pointed out that by 1963 the longer range "ultimate common system" outlined by RTCA is expected to be completed.

The list of devices that will bring aviation closer to automatic flight will include: very high frequency omni-directional range stations, operating on static-free radio waves which will provide very many flying courses radiating like the spokes of a wheel; and stations and measuring equipment linked with an automatic computer which will enable a plane to take a straight course past several ranges. Distance-measuring equipment, a link in the omni-range system, provides aircraft continuously with measurement of distance to stations.

Very important is an instrument landing system to make an electronic pathway to the runway. This will enable a pilot to make a safe landing when ceiling and visibility are below present minimums. The devices include beam radar to watch the fixed beam approach, giving a double check on the electronic pathway down to the runway.

Additional devices are improved runway- and approach-lighting to guide the final approach, also radar instruments to spot planes in the air, and to let them know by radio how many other planes are aloft and where they are. This automatic system will use devices already in existence and many which are now known to be possible but are not yet developed.

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CHEMISTRY

Big Lead Chloride Crystal Grown by Army Chemists

➤ ARMY CHEMISTS claim to have produced the biggest lead chloride crystal ever grown by man. It is over an inch and a third long and nearly an inch thick. It was prepared in a furnace used for growing rare crystals for high-precision equipment.

Small lead chloride crystals are common. In ordinary laboratory experiments they are made by cooling a hot-water saturated solution of lead chloride. This chemical compound is readily soluble in hot but not in cold water. When the hot-water solution cools, shining crystals are deposited.

The large crystal grown was produced by Dr. Joseph M. Ashcroft and Dr. A. Smakula, both Engineer Corps chemists at Fort Belvoir, Va. In the process a melt of purified commercial lead chloride crystals was lowered in a glass crucible through increasing temperatures by slow degrees, at a rate of less than half an inch a day. This was found necessary in order to produce a single crystal instead of a crystalline mass of small ones.

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AERONAUTICS

No Atomic-Powered Planes Seen For Next Few Years

➤ DON'T EXPECT any atomic-powered planes in the next few years, "even if further work does indicate that it is feasible," Dr. Robert F. Bacher of the U. S. Atomic Energy Commission cautioned the Washington Academy of Sciences.

Denying a published statement that 99% of the theoretical work for such was completed, the scientist-member of the Commission conceded that the main problems are technical and engineering, not scientific. But, he pointed out, the B-29 bomber took as long from design to production as did the atomic bomb.

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PUBLIC HEALTH

1948 Sets Record Low for Deaths from Many Diseases

➤ A RECORD LOW mortality with new low death records for influenza, pneumonia, tuberculosis, syphilis, appendicitis and diseases of childbirth is predicted for 1948 on the basis of figures through the first nine months of the year.

The healthy-year prediction comes from statisticians of the Metropolitan Life Insurance Company based on experience among the company's industrial policyholders.

The year has been particularly healthy for white women and girls, the mortality figures show.

Three out of the four principal "catching" diseases of childhood, scarlet fever, whooping cough and diphtheria, show minimal death records. The death rate for measles is up, because this has been a measles year with about three times as many cases as last year.

Cancer, the principal chronic diseases of heart, kidneys and blood vessels, and infantile paralysis show higher death rates than for last year.

The homicide rate remained the same as in 1947 but the rates for suicides and all forms of accidents are down.

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GENERAL SCIENCE

Wartime Typhus Conqueror Awarded Gorgas Medal

➤ HAILED as a conquering hero of one of man's dread wartime enemies—typhus—Brig. Gen. Edgar Erskine Hume received the Gorgas Award at the annual dinner of the Association of Military Surgeons in San Antonio, Texas.

The presentation of the medal and $500 cash award was made by Everett V. Scott, executive of Wyeth Incorporated, biological and pharmaceutical house. General Hume was cited as the man who first used DDT on a mass scale to check the typhus epidemic raging in Naples, thus protecting our GI's and millions of Italians.

Science News Letter, November 27, 1948

GENERAL SCIENCE

Japan's Scientists Will Elect Science Council

➤ WHEN 40,000 Japanese scientists on Dec. 20 elect 210 members of the country's first national science council, it will be the first attempt of any country to elect by scientific vote the members of its ranking science organization.

Five American scientists selected by the National Academy of Sciences will arrive in Japan late in November to consult with Japanese scientists in the development of that country's new "Democratic National Organizations for Scientific Activity."

The mission is headed by Dr. Detlev W. Bronk, president-elect of Johns Hopkins University, and other members are Drs. E. C. Stakman, University of Minnesota plant pathologist, Dr. Zay Jeffries, General Electric vice-president, Dr. I. I. Rabi, Columbia University Nobelist, and Dr. Roger Adams, University of Illinois chemist.

The top science bodies of other nations, such as the National Academy in the U. S. A. and the Royal Society in London, elect members by vote of the existing membership, not by franchise of the population of scientists.

Science News Letter, November 27, 1948

IN SCIEN

AERONAUTICS

Carrier-Based Jet-Fighter Successfully Tested

See Front Cover

➤ A TYPE of flying wing jet-fighter for shipboard operation has completed initial flight tests at the Naval Air Test Center, Patuxent River, Md. It is a tailless craft, but differs from the true flying wing in that it has a fuselage much like the familiar one on ordinary airplanes.

It has, however, the broad swept-back wings of the flying wing type which are known to be desirable in high-speed planes, as shown on the cover of this week's SCIENCE NEWS LETTER. This new plane, with two jet engines, is rated as capable of over 600 miles an hour. This means that it is potentially capable of speeds in excess of current models of operational jets, land or carrier-based.

The new plane is a product of Chance Vought Aircraft, Stratford, Conn., and will be known as the Navy XF7U-1. The unconventional appearing plane has two vertical stabilizers and rudders at the trailing edge of the wing. Longitudinal and lateral control are obtained through the use of a pair of "ailevators" which are combined ailerons and elevators.

Power plants of the new plane are two Westinghouse turbo jets. For combat performance, high bursts of speed may be obtained through after-burners. These, on the jet exhausts, give additional combustion and thrust. The air intake ducts are at the roots in the loading edge of the wings.

Science News Letter, November 27, 1948

PHYSICS

New Low Figure Set For Mesotron Mass

➤ A NEW bantamweight among atomic particles, that appears to have only ten times the mass of an electron, wrote its autograph on a photo-negative in the physics laboratory of the California Institute of Technology. Photograph and deductions based on it by Dr. E. W. Cowan appear in the journal SCIENCE (Nov. 12).

What the photograph actually shows are the vapor trails left by an electron and this hitherto unknown particle as they collided and violently changed courses. From what happened to the known electron Dr. Cowan calculated that the unknown stranger it ran into was a mesotron (or meson) having about ten times its mass.

Science News Letter, November 27, 1948

E FIELDS

MEDICINE

New Drug Shows Promise Of Relieving Muscle Spasm

➤ A DRUG even better than myanesin for relieving the muscle spasms of cerebral palsy, infantile paralysis and perhaps other conditions may be on the way. First reports of this drug, developed by Dr. F. M. Berger, University of Rochester scientist who discovered myanesin, appear in the journal, SCIENCE (Nov. 19).

Reporting the new drug with Dr. Berger are Drs. V. Boekelheide and D. S. Tarbell of the university.

The drug is one of a series of newly synthesized compounds known as dioxolanes. So far they have been tested only on laboratory animals. Trials on human patients will not be made for some months to come.

Among the new drugs are some with greater activity and a greater margin of safety than myanesin.

Science News Letter, November 27, 1948

ENGINEERING

Ship's Course Recorded By New Electrical Device

➤ A "SHIP steering recorder," which automatically and continuously records a ship's course, has been developed by engineers of the General Electric Company.

The new instrument marks the ship's rudder position and compass direction on a 12-inch moving roll of waxed paper, passing beneath metal points which are connected electrically with the ship's rudder and compass. The recorder calculates any deviation from the set course on the moving paper. Engineers claim that the device will detect an error in course as slight as two-tenths of a degree.

Several of the recorders are now being used experimentally by the U. S. Navy in destroyer and submarine chart rooms. No permanent installations of the equipment have been made as yet.

Science News Letter, November 27, 1948

PSYCHOLOGY

Human Beings Are Dogs In Dogs' Estimation

➤ YOU ARE a dog. At least, that's what you are in your dog's estimation.

Stated more formally: "Behavior patterns which dogs exhibit toward people are similar to those exhibited toward dogs." This is one of the conclusions reached in a comparative study of the social behavior of dogs and wolves by Dr. J. P. Scott of the Roscoe B. Jackson Memorial Laboratory at Bar Harbor, Maine.

Other conclusions are that social organization among both animal groups is largely connected with the food supply, and that there are almost no behavior patterns in dogs which are not also seen in wolves. However, in the domesticated dogs certain traits have been suppressed, others exaggerated, as the result of selection.

Wolves are relatively easy to domesticate, Dr. Scott stated, partly because they are by nature social animals and partly because their long puppyhood makes them dependent on help from their parents. A human foster-parent, fitting himself into this dependency pattern, has plenty of time to gain the young wolf's confidence and become accepted as just another wolf.

Dr. Scott presented the results of his researches before a special conference on methodology and techniques for the study of animal societies in New York.

Science News Letter, November 27, 1948

GEOLOGY

Atom-Powered Blisters Made Mountain Systems

➤ ATOMIC ENERGY, working slowly through millions of years instead of in a flash as in the man-made atom bomb, makes mountain systems by bulging the earth's crust up into immense blisters, which then collapse and let the heated rock beneath escape as magma or lava.

This "blister" hypothesis of mountain origin was presented before the meeting of the Geological Society of America in New York by Dr. C. W. Wolfe of Boston University.

A rough model of what happens can be seen in any pan of cooking breakfast cereal as it gets stiff and thick, except that the big, blister-like bubbles that swell up, burst and collapse are filled merely with steam instead of potentially liquid rock.

Heat, largely from atomic disintegration, accumulates in a zone not more than 50 miles deep below the earth's surface. This causes the overlying crust to bulge up into the blister, Dr. Wolfe stated. Around the margin of the blister a trough-like depression develops, technically known as a geosyncline. This is a zone of weakness, and the escape of the magma may take place either here or through the weakening, domed top of the blister itself.

Among other geologic phenomena which could be explained on the basis of the blister hypothesis, the speaker suggested, are changes in sea level, which have long been a sore puzzle to students of earth history. Formation of suboceanic blisters would account for a rhythmic rise and fall in sea level.

Science News Letter, November 27, 1948

ARCHAEOLOGY

California Inhabited by Humans During Ice Age

➤ WHEN ICE gripped the earth about 50,000 years ago, California was inhabited by some sort of human beings.

The remains of fires, tools and discarded shells of many ancient dinners have been found in shore deposits near what is now La Jolla, the Geological Society of America was told in New York by Dr. George F. Carter, geologist of Johns Hopkins University, Baltimore, Md.

When these La Jolla men lived the sea level was lower than now and now the ocean is rapidly eroding the buried evidence of these very early Californians whose skeletons have not been discovered.

Science News Letter, November 27, 1948

ENGINEERING

Automatic Dispatching Controls Elevator System

➤ RAPID SERVICE at timed intervals, due to automatic dispatching, features the "elevator of tomorrow" revealed in New York by the Otis Elevator Company. It is a system for a bank of elevators in a large business building in which regulated up-and-down service is provided by controls activated by electronic devices.

There are six traffic patterns experienced daily in most busy buildings: morning, noon and evening rush periods with heavy traffic either up or down, in-between two-way traffic periods, and night and holiday service. Two dials on the starter's panel can be set to meet these patterns.

One is a traffic-flow dial, with six positions to meet the six traffic patterns. The other is a dispatching-interval dial which can be set to dispatch elevators at regular intervals to handle most efficiently the traffic in the pattern period. The system has been dubbed "autotronic elevatoring" because dispatching, car spacing and passenger waiting time are controlled automatically and electronically. All manual adjustments are taken out of the hands of the starter.

The system offers particular advantage during rush-hour down-traffic at the end of a day for passengers on lower floors for whom elevators fail to stop because already loaded at higher floors. During this period, passenger-waiting time is automatically measured by electric condensers. If the voltage of a single condenser builds up to a pre-determined point, it activates an electronic tube which operates controls to cause an up-elevator to stop at the floor to take the passenger down. What actually happens is that some cars become diverted to pick up passengers in the low zones while others serve the higher floors. When the calls drop off, the system automatically readjusts itself to normal.

Science News Letter, November 27, 1948

ASTRONOMY

Bright Stars of Winter

The most brilliant stars of evening can be seen in December. Brightest of all is Sirius, the dog star, shining low in the southeast.

By JAMES STOKLEY

➤ THE MONTH of December brings us, on the 21st at 5:34 p.m., EST, the beginning of winter, for then the sun, which has been moving southward in the sky since last June, reaches its southernmost point, called the winter solstice. This, of course, is true only in the northern hemisphere, for south of the equator summer begins at the same time.

But besides winter, December brings us a view of our most brilliant stars of evening. Low in the southeast shines Sirius, the dog star, the brightest of all. Its position is indicated on the accompanying maps, which show the appearance of the skies at 10:00 p.m., your own kind of standard time, at the beginning of the month and an hour earlier around the 15th.

Sirius is in Canis Major, the great dog, one of two such animals among the constellation figures. The other is Canis Minor, the lesser dog, which is seen almost directly east, and a little higher. But above these two figures there can be seen one of the most familiar of all star groups—Orion, the giant warrior. He is typified by the three stars of similar brightness in a row which form his belt. To the left of the belt and a little higher is Betelgeuse, and on the other side is Rigel. Both of these are classed as of the first stellar magnitude in brightness. Orion, incidentally, is the only constellation visible from these northern latitudes which contains two first magnitude stars. The only other of which this is true is Centaurus, the Centaur, which is seen from more southerly latitudes.

The Twins

In the east, directly above Canis Minor, we find Gemini, the twins. Pollux, lower of the two brightest stars, is first magnitude, but his brother Castor, is not. Passing above Orion, we come to Taurus, the bull, with brilliant Aldebaran. Still higher, in the east above Gemini, is Auriga, the charioteer, with Capella, which is brighter still.

The only other first magnitude stars shown in the December maps are low in the northwest, where their splendor is somewhat dimmed. One is Vega, of Lyra, the lyre, shown close to the horizon, while the other is the nearby Deneb, in Cygnus, the swan.

Among somewhat fainter constellations now in good position we have Perseus, the champion, directly overhead. In this is Algol, the "demon" a famous variable star. It consists of two seperate globes, revolving around their center of gravity. One is much brighter than the other, but every two days, 21 hours, the darker orb comes in front of it, and makes it appear fainter. Such a pair is called an "eclipsing variable." Some other stars are truly variable, that is, there is an actual change of the amout of light which they emit.

Though no planet appears on the maps, Saturn, about as bright as Betelgeuse, appears a little later in the evening in the east in the constellation of Leo, the lion. Venus, many times as brilliant, rises in the east shortly before the sun. At sunrise it stands about 20 degrees above the southern horizon. Mercury, Mars and Jupiter are all too nearly in the same direction as the sun to be observed. In the constellation of Gemini is the planet Uranus, but even though it is closest on December 20, it still requires some optical aid to reveal its presence.

Full Moon

The night of Dec. 15-16 brings the full moon of December. As it rises that night in the east just as the sun goes down in the west, many people will see it—and wonder why it looks so big. This apparent enlargement of the moon near the horizon, which also occurs with other celestial bodies, is one of the most familiar of sky-effects, and also one of the least understood.

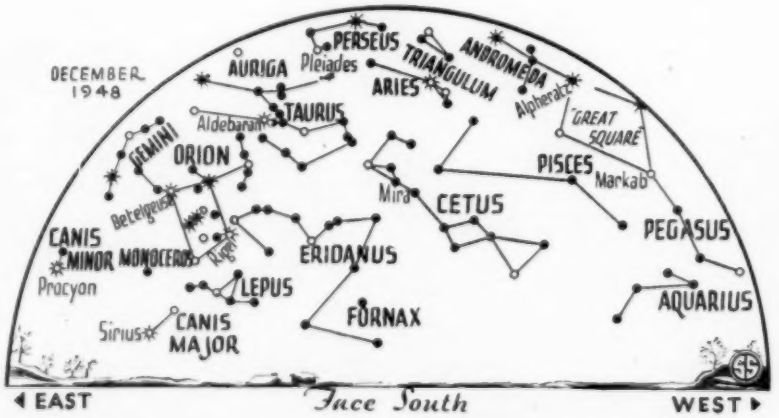
One of the most common explanations ascribes it to the fact that when the moon is near the horizon we compare it with terrestial objects such as houses or trees. However, no one has ever been able to explain why such a comparison should make it look big, rather than small, and furthermore, the effect is observed with the moon rising at sea. Then there is a perfectly plain horizon with no objects for comparison.

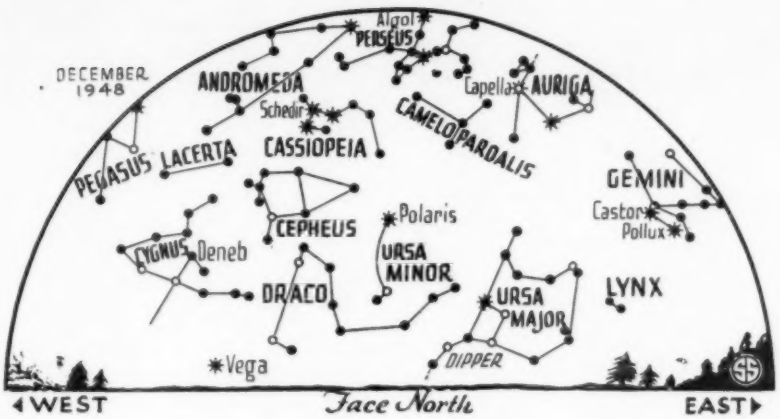
Explore Illusion

Some of the most exhaustive of recent researches to determine the cause of this illusion have been made by a Harvard psychologist, Dr. Edwin G. Boring, in collaboration with A. H. Holway, L. M. Hurvich and D. W. Taylor. They made careful experiments indoors and out, with artificial moons as well as the real thing, looking at it directly and in mirrors, etc. Several papers have appeared in scientific journals reporting their results, and these have been clearly summarized by Dr. Boring. Writing in a chapter in FOUNDATIONS OF PSYCHOLOGY (John Wiley and Sons, 1948), which he edited with Dr. Herbert S. Langfeld of Princeton and Dr. Harry P. Weld of Cornell, he uses this as an example of the scientific use of hypothesis. He says:

"When an hypothesis is verified, you are very likely to find that it sets up new problems. So now you think up new finer hypotheses to direct you toward finding out why the hypothesis just verified is true, and that process of refinement can go on practically forever.

"This study of the moon illusion shows this process operating. It was early observed that the moon looks larger on the horizon than up in the heavens. Many hypotheses were advanced—that the difference is due to refraction at the horizon, or due to the atmospheric haze at the horizon, or due to the fact that the moon looks farther away at the horizon and thus would have





to be big in order to give the normal-sized image on the retina.

"The first two hypotheses fail when tested by the camera. A photograph of the horizon moon is as small as the photograph of the moon in elevation. The third hypothesis fails because the horizon moon no longer looks large when you bend over and view it between your legs. The next hypothesis is that the illusion depends on looking up, and that hypothesis has been proved. It holds even for experimental moons only 30 meters away.

"So now you know; the phenomenon is an illusion and not an astronomical change, and it depends on looking up. But why, you ask at once. That needs another hypothesis. Perhaps what shrinks the moon is raising the eyes, or perhaps it is bending the neck. That question has been answered. The raised-eyes hypothesis is right, the bent-neck hypothesis is wrong. So, by forming and testing new hypotheses, you have refined your knowledge.

"Now you want to know why raising the eyes shrinks the moon, but no one has yet been clever enough to formulate for test the crucial hypothesis that will answer that question. Sometime it will be done."

Time Table for December

Dec.	EST	
1	10:27 p. m.	Algol at minimum
4	7:16 p. m.	Algol at minimum
8	6:00 a. m.	Moon farthest, distance 251,200 miles
	8:57 a. m.	Moon in first quarter
12	early a. m.	Meteors of Geminid shower visible
16	4:11 a. m.	Full moon
20	7:00 a. m.	Uranus nearest distance 1,675,000,000 miles
	12:00 noon	Moon nearest, distance, 229,100 miles
21	3:51 a. m.	Moon passes Saturn
	5:34 p. m.	Sun farthest south, winter commences in northern hemisphere
22	12.11 a. m.	Algol at minimum
23	12:12 a. m.	Moon in last quarter
24	9:00 p. m.	Algol at minimum
27	5:49 p. m.	Algol at minimum
28	1:20 a. m.	Moon passes Venus
30	4:44 a. m.	New Moon

Subtract one hour for CT, two hours for MT, and three for PT.

Science News Letter, November 27, 1948

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PLANT PATHOLOGY

Uranium Found To Cause Hereditary Changes

➤ URANIUM, the atom-bomb element, is able to cause hereditary changes in plants when supplied in the form of its nitrate salt. Experiments demonstrating such changes in two widely different kinds of fungi are described in SCIENCE (Nov. 19), by Dr. E. C. Stakman, professor of plant pathology at the University of Minnesota and president-elect of the American Association for the Advancement of Science, together with Drs. J. M. Daly, M. L. Gattani and I. Wahl.

When supplied to the spawn of ordinary mushrooms, it produced mutants that grew from five to seven times faster than the original mushroom strains from which they were derived. Another fungus on which the uranium compound wrought hereditary changes was the one that causes smut disease in corn.

Dr. Stakman feels that these same effects may be obtained in other plants and perhaps animals. The uranium used in these experiments was of the ordinary kind, not the highly radioactive U236. The culture medium containing it is described as "mildly radioactive".

Science News Letter, November 27, 1948

"The whole world is queer except thee and me, and sometimes even thee seems a little queer"

HANDBOOK OF PSYCHIATRY

by Winfred Overholser, A.B., M.D., Sc.D. and Winifred V. Richmond, B.S., A.M., Ph.D.

It is the authors' belief that much of the layman's dread of mental abnormalities comes from ignorance of the psychiatric disorders and their treatment, and the way must be prepared for the understanding of the problems of prevention and therapy.

To such clarification this book is aimed, and the following subjects are discussed: the difference between psychology and psychiatry, the development of psychiatry and psychoanalysis, the role of psychiatry in daily life, and various mental illnesses and their treatment.

The reviewers have said of this book: ". . . it would probably be difficult to find a more admirable 'first reader' in psychiatry;" ". . . a sensible and authoritative discussion of the modern concepts of psychiatry . . . well documented, simply worded, and carefully prepared;" ". . . understandable to the laity and also informative to the expert."

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RADIO

FM for Local Schools

➤ SCHOOL and college use of FM radio transmitters, in so-called educational stations for which the Federal Communications Commission has set aside special wavelengths, gives promise of rapid development with new, inexpensive equipment now available.

FM stands for frequency modulation, the type of static-free radio transmission coming widely into use. It is "line-of-sight" transmission, which does not follow the curvature of the earth and is available ordinarily only to receivers within some 50 miles of the sending station. The new transmitters proposed for use in the educational program would have power enough to carry only from some five to 15 miles.

One of these new FM transmitters is a General Electric product. It furnishes ten watts of power in the 88-108 megacycle frequency range, where its signals may be received on standard FM receivers. Its coverage is from five to 10 miles. It is suitable for church and community programs as well as for educational stations.

Another transmitter is a product of Radio Engineering Laboratories, Long Island City, N. Y., and is called a Serrasoid Modulator. Its first showing was at a recent FM convention in Chicago. It is described as holding promise of bringing FM programs within reach of many communities and groups now denied radio facilities because of high cost.

This transmitter is said to have high-fidelity on low power. Its local area can be well defined and scores of local stations could therefore use the same wavelength over the country without interference. The new system thus reinforces FM's potentiality of providing America with thousands of radio stations compared with the limited number of overlapping and expensive AM stations now in use. AM, amplitude modulation, is the type of radio transmission employed in the familiar long-used radio systems.

Science News Letter, November 27, 1948

ENGINEERING

Weather Stations Use Wind-Driven Generators

➤ NEXT THERE will be an automatic weather-reporting station needing no attention for a year at a time. An apparatus that utilizes the wind for power is under development in the Army Signal Corps laboratory, Fort Monmouth, N. J. It is designed for use in out-of-the-way places, such as north of the Arctic Circle.

Automatic weather stations are now in use in various parts of the world. They send out by radio signals information on temperature, humidity, wind velocity and direction, and other data hourly or at other intervals. The power to create the energy for their radio signals is provided by a gasoline-driven generator which is started and stopped by a clock. Electrical energy keeps the clock wound. These stations need a new supply of gasoline about once a month. Once they utilize wind-power, little attention will be needed.

The wind in these new weather-reporting stations will drive an electrical generator to charge a bank of storage batteries. The batteries, in turn, will operate the radio and other equipment. A wind of seven miles per hour will generate electricity in the type of equipment to be used, and one of 24 miles per hour will produce the generator's rated output of 2.5 kilowatts. An automatic regulator will prevent over-charging of batteries.

The windmill is not the familiar long-armed type, but a three-bladed propeller. It will be mounted on a tower, the height of which will depend upon the intensity of winds at any particular installation. The wind propeller was developed by scientists of the Signal Corps and the Wind Turbine Company of West Chester, Pa.

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ENTOMOLOGY

DDT-Resistant Fly Strains Take 50 Times Normal Dose

➤ DDT, used freely to kill off flies, provokingly continues to act as an agent of quasi-natural selection, producing strains that represent the survival of the toughest. Dr. James R. Douglas, entomologist at the University of California's College of Agriculture in Davis, Calif., reports finding flies that require 50 times the normal dose of DDT to kill them. There was nothing wrong with the DDT, for it readily killed non-resistant strains of laboratory-reared flies.

Science News Letter, November 27, 1948

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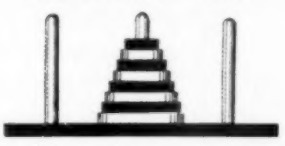

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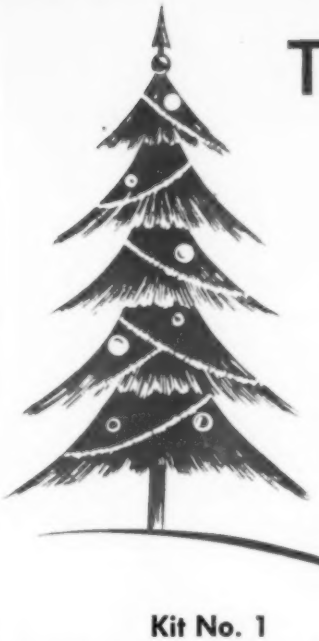

Three Christmas Gift Ideas for EAGER-MINDED CHILDREN

Kit No. 1

FUNdamentals of Science

MAGNETISM AND ELECTRICTY

Equipment and instructions for 56 experiments on magnetism (making a compass for instance), static electricity, the electrophorus, the electroscope, making a condenser, electric currents, making a galvanometer, and electroplating are contained in this kit.

Specifically, the equipment consists of: MAGNETISM—Horseshoe-type Magnet, Package of Iron Filings, Compass Card, Lodestone. STATIC ELECTRICITY—Sealing Wax, Metal Foil, Pyrex Test Tube, Fur, Cornstalk, Gold Leaf, Metal Disk and Sheet of Acetate Film for Electrophorus. CURRENT ELECTRICITY—Zinc Strip, Coil of Insulated Copper Wire, Carbon Rod, Sal Ammoniac. ONE PARTS BOX CONTAINING—a compass bearing, steel needles, steel pins for compass, gummed strips, soft iron nail, cork disks, ball bearings, straw, ball and pin for electroscope.

Kit No. 2

FUNdamentals of Science

BLACK LIGHT AND GLOWING MATERIALS

26 experiments on fluorescence, phosphorescence, and glowing paints are suggested in the instructions for this kit, along with how to use fluorescent material in crime detection and how to get stroboscopic effects.

Specifically, the equipment consists of: SIX MINERAL SPECIMENS—Wernerite, Semiopal, Autunite, Green Fluorite, Willemite, Brown Fluorite.

SEVEN VIALS OF GLOWING MATERIALS:
Fluorescent—Deep Yellow, Blue-Green, Cerise, Light Yellow; Phosphorescent—Light Green, Gray-white; Special—Greenish Gray-tan.
One Vial of Gum Arabic, AND
A fluorescent golf tee, a brush, a star map, a stroboscope, a picture (for coloring). One 110-Volt Argon Lamp—Rich in ultra-violet.

Kit No. 3

FUNdamentals of Science

SOILLESS GARDENING

This kit has the instructions and the equipment for a soilless garden in the house or in an apartment without regard to weather. How to plant seeds, how to water and feed them, how to transplant, about water culture, sand culture, soilless gardening on gravel or cinders, about deficiency symptoms, about seedless fruit hormone, and how to produce seedless tomatoes, and how Hormodin is used—all this knowledge is in the Soilless Gardening Kit.

There are suggested experiments with sprouting seeds, and how to speed germination; on the importance of chemicals and how plant roots produce acid; about phototropism and geotropism; how to grow carrots upside down; how to perform tricks with plants (changing the length of day) and what total darkness does to plants; what light versus gravity does, colored light, and the use of colored tents.

Specifically the equipment consists of: One dozen green POTS (that you can assemble); COLORED CELLOPHANE sheets to be used in light and growth experiments; CHEMICALS your plants will need—potassium acid phosphate, magnesium sulfate, calcium nitrate, ferrous sulfate; Seven kinds of SEEDS—Russian sunflower, Earliana tomato, Globe radish, Dwarf nasturtium, Okra, Soya bean, Ornamental gourds; Box of VERMICULITE; Plant Breeding Material—HORMODIN, SEEDLESS FRUIT HORMONE.

Each kit comes in a colorful, sturdy, wooden box with metal clasps, each kit is expertly wrapped for shipping in corrugated board and heavy kraft paper. Each kit contains the materials (as listed above) for scientific experiments and a book of instruction that is carefully written for easy reading. But most important, each kit contains hours of concentrated enjoyment and new worlds of understanding. Each kit costs $4.95.

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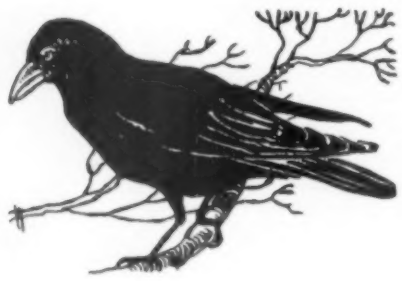
ORNITHOLOGY

NATURE RAMBLINGS

by Frank Thone



South for the Winter

➤ USUALLY, when we talk of birds going south for the winter, we think of their leaving northern lands that will soon be frostbound and seeking warm, sunny regions until spring shall send them north again. This is the migration of bluebird and oriole, of duck and goose; the pattern is so prevalent that we are prone to think of it is as exclusive.

Yet birds are all about, in winter; even the least observant of us sees and hears them. Their presence is apt to be explained by an easy, "Oh, they stick around the whole year."

This is by no means necessarily the case, and of some birds it is not true at all. Whole populations of birds that are seen in the northern states during the snowy season disappear or become pretty scarce in summer; nuthatch and brown creeper, for example, and that mighty hunter of mice, the great horned owl. Most such birds nest in Canada, though in some species the summer breeding range does extend down into the United States a little.

In some cases, too, we apply the permanent-resident explanation to a bird species because we see representatives around practically all the time, and assume they are the same individuals. However, what we are likely to have is an overlapping of two migrant populations that do not go very far. Crows that we see in summer are very apt to flap southward a few hundreds, or perhaps only a few scores, of miles to their winter range. In the meantime their place in our landscape is taken by other crows from a little farther north. And since all crows look alike to us, we assume that no migration at all has taken place.

The European starling, a recently introduced species that has become a spreading pest, has developed this limited and overlapping migration to a marked degree. The starling flocks that are wholly undesired feature of downtown Washington, D. C., in winter are migrants from western New York and Pennsylvania. The Capital's summer starling population in the meantime is spending the winter as uninvited guests of communities in North Carolina and southern Virginia.

Occasionally, of course, you will see or hear of a normally migrating bird that hasn't bothered to migrate at all. Robins that remain through winter, sometimes consorting with flocks of rowdy sparrows, are among the most frequently reported of such cases. This probably represents a response to easily available handouts of food, rendering the southward trip unnecessary.

Science News Letter, November 27, 1948

ENGINEERING

Cloud Heights Computed From Planes in Flight

➤ THE HEIGHT of a cloud can now be accurately determined from aircraft in flight by means of a simple device, a modified illuminated gunsight, developed in Fort Monmouth, N. J., in Army Signal Corps laboratories.

The instrument is mounted on a frame and coupled to two indexing arms which slide along a graduated scale. In use, the gunsight is trained on some prominent cloud feature which is then tracked for a minute or so. During this period of tracking, one of the indexing arms remains fixed on the scale and the other moves.

At the end of the tracking period the vertical distance between plane and cloud may be computed from the air speed, time of tracking and the difference in scale readings at the two arms. The actual cloud height above the earth is this distance added to or substracted from the reading on the plane's altitude instrument, depending on whether the cloud is above or below the aircraft.

Science News Letter, November 27, 1948

PUBLIC HEALTH

If You're 65 Years Old, You Should Live To Be 80

➤ SIXTY-FIVE-year-olds today can look forward to living almost to the age of 80, statisticians of the Metropolitan Life Insurance Company assure them. The average white man aged 65 has 12 and two-thirds more years of life. The average white woman has even more, 14 and one-half years. For the fairly sizable proportions of persons who will reach age 75, there remain, on the average, seven and three-fourths years for men and more than eight and one-half years for women.

Science News Letter, November 27, 1948

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Books of the Week

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ALL ABOUT FOX TERRIERS: A Complete Manual on History, Care and Training with Practical Information on How to Breed High-Class Dogs—George Frank Skelly—*Judd*, 299 p., illus., $4.00.

THE CHEMICAL TECHNOLOGY OF DYEING AND PRINTING: Vat, Sulfur, Indigosol, Azo and Chrome Dyestuffs and Their Auxiliaries—Louis Diserens—*Reinhold*, 500 p., $11.00. Translated from the second German edition by Paul Wengraf and Herman P. Baumann. Especially for the chemist and colorist.

ECONOMIES IN SEASONING—*Northeastern Wood Utilization Council*, 75 p., illus., paper, $2.00. Much high-grade lumber is lost in the seasoning process.

EXPLORING ELECTRICITY: Man's Unfinished Quest—Hugh Hildreth Skilling—*Ronald Press*, 277 p., illus., $3.50. Fascinating tales about men who looked for new things in the field of electricity; from Thales, who discovered what rubbing amber could do, to Lawrence and the atom smasher, Oppenheimer and the bomb.

FUNDAMENTALS OF PSYCHOANALYSIS—Franz Alexander—*Norton*, 312 p., $3.75. An attempt by an authoritative writer to formulate basic principles in the field and to indicate their application in treatment. Theoretical discussion is minimized in the interest of clarity for the student.

GUARDING OUR WILDLIFE RESOURCES—Rachel L. Carson—*Govt. Printing Office*, 46 p., illus., paper, 30 cents. All animal lovers will be interested in this beautifully illustrated booklet.

THE INTERNATIONAL GAME FISH ASSOCIATION YEAR BOOK 1948—*International Game Fish Association*, 72 p., illus., paper, free upon request to publisher at American Museum of Natural History, New York, N. Y. Fishermen all over the world have common interests and enthusiasms regardless of political boundaries.

LET'S MEASURE THINGS—E. Laurence Palmer—*N. Y. State College of Agriculture*, 63 p., illus., paper, free upon request to publisher at Cornell University, Ithaca, N. Y. One of the well-known Cornell Rural School Leaflets telling how to measure or estimate a variety of things from the weight of trout and size of shot to the intensity of light and the height of clouds.

NEWER SYNTHETIC ANALGESICS—M. L. Tainter and others—*New York Academy of Sciences*, 174 p., illus., $2.75. An interesting symposium on pain and the most modern method of relieving it.

NO PLACE TO HIDE—David Bradley—*Little, Brown*, 182 p., $2.00. The atomic era, the author points out, fortunately or otherwise is now man's environment, to control or to adapt himself to as he can. The public, for their own protection will have to match natural laws with civil laws. Science and sociology are as inseparable now as man and his shadow. This book is concerned with the deadly radiation spread in the wake of the atomic bomb.

PREVENTION OF DETERIORATION ABSTRACTS—*National Research Council*, 2,000 p. (approx.) per year, loose leaf with binder and index guides, $37.50 per year. Abstracts are classified under headings such as biological agents, fungicides, leather, etc., An "Advance List," a monthly bibliography of reports received, is available for $10.00.

SELECTED WORKS OF HENRY CLAPP SHERMAN: Mitchill Professor Emeritus of Chemistry, Columbia University—*Macmillan*, 1056 p., illus., $5.00. Timely in this day when the feeding of the world is a major problem is this compilation of writings of a man invariably thought of in connection with nutrition.

A TREATISE ON THE NORTH AMERICAN RANUNCULI—Lyman Benson—*American Midland Naturalist*, 264 p., paper, $1.25. Approximately 600 collections of this genus of flowering plant were made in 36 states, Canada and Mexico.

Science News Letter, November 27, 1948

AERONAUTICS

Jet-Propulsion Progress

➤ THE RECENT non-stop test flight of more than 3,400 miles made by the jet-propelled, eight-engined Northrop YB-49 Flying Wing bomber was a striking demonstration of the progress made in jet-propulsion in the six years since the first American jet-propelled fighter plane was constructed.

This "early" jet-propelled plane was the Bell Aircraft's Airacomet, the P-59A, whose development and production was announced by the Army in January, 1944. This airplane, fitted with two jet units built by General Electric to British designs, made its first flight on Oct. 1, 1942, 17 months after the first successful flight had been made in England with the Whittle jet engine, the prototype of the American power unit.

It was a single-seat plane, approximately 38 feet long and with a wingspan of 45.5 feet, that had a maximum speed of over 400 miles per hour, and a range limited by the amount of fuel it could carry. Its empty weight was about 8,000 pounds, while its loaded weight was somewhat less than 11,000 pounds.

In contrast, the Northrop Flying Wing has a wingspan of 172 feet but is only 53 feet long because it has neither the conventional fish-shaped fuselage nor a tail. It is composed of two broad, back-sloping wings which are thick enough in the near-junction region to hold a crew of from six to 10 men, thousands of gallons of jet fuel, eight GE-designed, Allison-built J-35 jet engines, 15 tons of bombs, and other necessary equipment. It is in the 500-miles-an-hour class.

The U. S. Air Force has several other jet-propelled bombers in addition to its speedy jet-propelled fighters. The Douglas XB-43 is said to be the first U. S. bomber designed for jet-propulsion. It is a twin-engine affair with a range of some 1,400 miles. The North American XB-45 was one of the first operational Air Force jet bombers. It utilizes four General Electric jet-engines.

The Consolidated-Vultee XB-46 is also a four-jet bomber. Its service range is about 800 miles. The Boeing XB-47, known as the Stratojet, has sharply swept-back wings and tail surfaces. It has six General Electric jet engines. The Martin XB-48 has six General Electric-Allison J-35 engines that develop a total thrust of 24,000 pounds. It has a bomb capacity of 10 tons, a speed of over 480 miles an hour, and a combat radius of some 800 miles.

Science News Letter, November 27, 1948

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⚙ *AUTOMATIC defroster, for the electric household refrigerator, is a relatively small device which is plugged into an electric outlet and into which the refrigerator cord is plugged. It eliminates the necessity of hand defrosting, maintains a thin film of frost on the freezing unit and prevents ice from accumulating on it.*

Science News Letter, November 27, 1948

⚙ *SHOCK-ABSORBING HAMMER, recently patented, absorbs the rebound when a working surface is struck. The head, in two parts that screw together, has an elongated hollow on the inside which contains air and a slidable bolt-like part. Vents open from the air spaces at each end of the bolt to permit air movement in and out.*

Science News Letter, November 27, 1948

⚙ *LIQUID CARBONATOR, to charge an individual glass of water or other liquid with carbon dioxide with the use of dry ice, consists of a drinking glass which has a disk of sponge or porous glass set in its bottom and a shallow base into which the glass fits. A tiny piece of dry ice placed in the base discharges gas which passes through the porous inset.*

Science News Letter, November 27, 1948

⚙ *SMALL circular valve, shown in the hose line near the facepiece, permits oxygen to flow into a patient's lungs with intermittent positive pressure. It interrupts delivery of oxygen when the capacity of the lungs has been reached and permits normal exhalation with suction.*

Science News Letter, November 27, 1948

⚙ *SNOWPLOW WAX, applied to plow moldboards and wings with a spray gun or with an ordinary paintbrush, creates a hard, slick surface off which the snow slides easily. It prevents the so-called snow piling which means costly clearing delays.*

Science News Letter, November 27, 1948

⚙ *TOBACCO PIPE, to give a mentholated smoke when desired, has a vaporizing chamber in its duraluminum stem into which a menthol ointment is placed. Unburned menthol vapor is picked up by the smoke as it is drawn through the stem.*

Science News Letter, November 27, 1948

⚙ *BABY BOTTLE WARMER and vaporizer combined is an electrically heated unit which when plugged into the ordinary household electric outlet forces hot water up through sidewalls and plays it against the sides of a contained bottle. For use as a vaporizer, a special cap is inserted in the top of the bottle warmer.*

Science News Letter, November 27, 1948

• Do You Know? •

Metals five to ten times stronger than those of today are predicted.

Good food value is saved when *potatoes* are boiled whole in their skins.

Approximately 90% of the *shellfish*, principally clams, produced in Canadian Maritime Provinces is shipped to the United States.

The giant redwood and other *trees* of the coniferous group are rated by scientists as evolutionally less advanced than the humble dandelions and sweet peas of our lawns and gardens.

Bee losses in northern states are heavy during some winters, death coming from starvation, not cold weather; a normal *bee colony* may need as much as 90 pounds of honey to carry it through a long, cold winter.

Bamboos, some of which get to be 40 feet high, are rated by botanists as grasses.

Experts suggest covering newly laid *water pipes* with straw or hay during the first winter, even if they are installed below frost level; the earth fill over them is loose for a year or so and frost may go deeper than otherwise.

The 56 firms producing *motor vehicles* in the United States are supplied by more than 1,000 parts plants.

Nearly three-fourths of the *fertilizer elements* in the feed livestock eat is returned for re-use in the manure.

A 14,000-mile *wildfowl survey* was made from the air during the past summer over the Arctic slope of Alaska and the Canadian Northwest Territories.

Sunflower and safflower seed are coming into such increased uses in the United States for *feed and oils* that official grain standards have been established by one state, at least; this is Minnesota.

Fish in farm ponds grow more rapidly if the pond is fertilized; the fish do not consume the fertilizer directly, but they derive the benefit of increased growth of plankton, the tiny water plants which are their major source of food.

If *automobiles* had been invented 25 years earlier, it is a question if they could have developed enough power to move their massive engines because of the lack of proper alloy steel.

Science News Letter, November 27, 1948

Goggles coated with allyl sucrose, a sugar, are being tested by welders; the treated goggles may be used for many hours without changing, it appears.

The world's *standard meter* is a bar of platinum-iridium preserved in a deep underground vault near Paris, protected in a triple case of glass, hard rubber and wood.

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